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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/595,660

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EXAMINER

ROE, JESSEE RANDALL

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/595,660	Applicant(s) SHINDO, YUICHIRO	
	Examiner Jessee Roe	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 December 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 7-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-2 and 7-19 is/are rejected.
- 7) ☒ Claim(s) 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of the Claims

Claims 1-2 and 7-19 are pending wherein claim 2 is amended, claims 3-6 are canceled, and claims 7-19 are new.

Terminal Disclaimer

The terminal disclaimers filed on 11 December 2008 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of copending Applications 10/565767 and 11/994167 have been reviewed and are accepted. The terminal disclaimers have been recorded.

Status of Previous Rejections

The previous provisional rejections of claims 1-2 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-2 of copending Application No. 10/565,767 and claims 1-2 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-2, 4 and 10 of copending Application 11/994,167 are withdrawn in view of the terminal disclaimers filed on 11 December 2008.

Claim Objections

Claim 15 is objected to because of the following informalities: "is" should be added between "film" and "a" in line 1 of claim 15. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 7-10 and 12-19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In regards to claims 7, 12 and 16, the specification does not provide support for the range in the recitation “wherein said high purity hafnium of said sputtering target has a residual resistance ratio of at least 120”.

In regards to claims 8, 13 and 17, the specification does not provide support for the range in the recitation “wherein said high purity hafnium of said sputtering target has a residual resistance ratio of 120 to 200”.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 7-10 and 12-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In regards to claims 7, 12 and 16, the upper limit of the resistance ratio is unclear and undefined by the recitation "wherein said high purity hafnium has a residual resistance ratio of at least 120".

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-2 and 7-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shindo (US 2003/0062261).

In regards to claims 1-2 and 11, Shindo ('261) discloses a high purity hafnium metal with minimal impurities (abstract). Shindo ('261) discloses (Example 2) forming a 4N (99.99%) purity level hafnium metal excluding gas components such as carbon, oxygen, and nitrogen [0133]. Oxygen and carbon would be present at levels less than 100 ppm and forming a sputtering target or thin film (claim 4) and zirconium would present at levels of 0.5 weight percent or less (claim 7).

The Examiner notes that the composition disclosed by Shindo ('261) overlaps the composition of the instant invention, which is prima facie evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the claimed amount of gas components such as oxygen, carbon, and nitrogen from the amounts disclosed by Shindo ('261) because Shindo ('261) discloses the same

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utility throughout the disclosed ranges.

With respect to the recitation "a sulfur content of 10wtppm or less, a phosphorus content of 10wtppm or less, and a zirconium content of 0.1wt% or less" as in claims 1-2, the Examiner notes that purer forms of known products may be patentable, but the mere purity of a product alone does not render the product unobvious. MPEP 2144.04 (VII).

With respect to the amended transitional term "consisting" in claim 2, the Examiner notes that the products disclosed by Shindo ('261) does not require elements in addition to hafnium. Therefore, Shindo ('261) meets the claim.

With respect to the recitations "wherein said high purity hafnium of said sputtering target has a residual resistance ratio of at least 120" of claims 7, 12 and 16, "wherein said high purity hafnium of said sputtering target has a residual resistance ratio of 120 to 200" of claims 8, 13 and 17, and "wherein said oxygen content is 10wtppm or less" of claims 9, 14 and 18, Shindo ('261) discloses that oxygen would be reduced to 500 ppm or less [0064]. Therefore the recited residual resistance ratio would be expected. MPEP 2112.01 I.

With respect to the recitation "wherein said sputtering target has a body produced by subjecting a hafnium raw material to electron beam melting to form a hafnium ingot, subjecting the ingot to deoxidation with molten salt, and forming a sputtering target from the ingot after said deoxidation" of claim 10, the Examiner notes that the claims are drawn to a product and not a process. Even though product-by-process claims are limited by and defined by the process, determination of patentability

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is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.

With respect to the recitation "wherein said thin film a sputtered thin film produced by subjecting a hafnium raw material to electron beam melting to form a hafnium ingot, subjecting the ingot to deoxidation with molten salt, forming a sputtering target from the ingot after said deoxidation, and depositing said thin film on the substrate by performing sputtering with the sputtering target" of claim 15, the Examiner notes that the claims are drawn to a product and not a process. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.

With respect to the recitation "wherein said high purity hafnium is produced by subjecting a hafnium raw material to electron beam melting to form a hafnium ingot and subjecting the ingot to deoxidation with molten salt" as in claim 19, the Examiner notes that the claims are drawn to a product and not a process. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or

obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.

Claims 1-2, 7-10 and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the ASM Handbook Volume 2.

In regards to claims 1-2, the ASM Handbook Volume 2 discloses (pg. 1094, col. 2) purifying metals such as hafnium to a purity approaching 99.999% by chemical vapor deposition when a low-iron starting material would be used. The ASM Handbook further discloses that if the proper temperature is maintained, oxygen, nitrogen, hydrogen, carbon, and other typical metal impurities would not be carried over.

The Examiner notes that the purity of the hafnium disclosed by the ASM Handbook Volume 2 overlaps the purity of the instant invention, which is prima facie evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the claimed hafnium purity from the hafnium purity disclosed by the ASM Handbook Volume 2 because the ASM Handbook Volume 2 discloses the same utility throughout the disclosed range.

With respect to the recitation "A sputtering target or thin film, comprising a sputtering target or thin film formed of high purity hafnium", the Examiner notes that although the ASM Handbook Volume 2 does not specify the size of the hafnium metal, "a sputtering target or thin film" is not defined to exclude any

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specific size or shape of metal. Furthermore, changing the size/proportion of the hafnium metal would not patentably distinguish over the prior art. MPEP 2144.04 (IV).

With respect to the amended transitional term "consisting" in claim 2, the Examiner notes that the ASM Handbook Volume 2 does not require elements in addition to hafnium. Therefore, the ASM Handbook Volume 2 meets the claim.

With respect to the recitations "wherein said high purity hafnium of said sputtering target has a residual resistance ratio of at least 120" of claims 7 and 16, "wherein said high purity hafnium of said sputtering target has a residual resistance ratio of 120 to 200" of claims 8 and 17, and "wherein said oxygen content is 10wtppm or less" of claims 9 and 18, the ASM Handbook Volume 2 discloses (pg. 1094, col. 2) discloses that oxygen would not be carried over. Therefore the recited residual resistance ratio would be expected. MPEP 2112.01 I.

With respect to the recitation "wherein said sputtering target has a body produced by subjecting a hafnium raw material to electron beam melting to form a hafnium ingot, subjecting the ingot to deoxidation with molten salt, and forming a sputtering target from the ingot after said deoxidation" of claim 10, the Examiner notes that the claims are drawn to a product and not a process. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior

product was made by a different process.

With respect to the recitation "wherein said high purity hafnium is produced by subjecting a hafnium raw material to electron beam melting to form a hafnium ingot and subjecting the ingot to deoxidation with molten salt" as in claim 19, the Examiner notes that the claims are drawn to a product and not a process. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.

Response to Arguments

Applicant's arguments filed 11 December 2008 have been fully considered but they are not persuasive.

First, the Applicant primarily argues that Shindo ('261) fails to disclose a refining step of subjecting an ingot to deoxidation with molten salt which makes possible the reduction of oxygen to 40 wtppm or less required by the claims of the present application.

In response, the Examiner notes that oxygen and carbon would be present at levels less than 100 ppm, which includes 0 ppm oxygen (claim 4). Thus, the composition of the products produced in Shindo ('261) include the products of the instant invention.

Second, the Applicant primarily argues that Shindo ('261) fails to disclose a

zirconium content of 0.1 weight percent or less. In response, the Examiner notes that Shindo ('261) discloses that zirconium would present at levels of 0.5 weight percent or less (claim 7). Thus, the composition of the products produced in Shindo ('261) include the products of the instant invention.

Third, the Applicant primarily argues that electron beam melting as described in the cited reference cannot reduce oxygen to levels required by the present application.

In response, the Examiner notes that the claims are drawn to a product and not a process. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. Furthermore, the Examiner notes that the compositions disclosed by Shindo ('261) overlaps the compositions of the instant invention.

Fourth, the Applicant primarily argues that the ASM Handbook Volume 2 fails to specifically disclose the zirconium content and oxygen content of a purified hafnium and fails to make obvious to one of ordinary skill in the art a hafnium material having a zirconium content of 0.1 weight percent or less and oxygen content of 40 wtpm or less.

In response, The ASM Handbook further discloses that if the proper temperature is maintained, oxygen, nitrogen, hydrogen, carbon, and other typical metal impurities would not be carried over (pg. 1094, col. 2). Thus, it would have been obvious to one having ordinary skill to optimize temperature in order to reduce the presence of oxygen

and typical metals, such as zirconium, from the hafnium. MPEP 2144.05 II.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessee Roe whose telephone number is (571) 272-5938. The examiner can normally be reached on Monday-Thursday and alternate Fridays 7:00 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Roy V. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/
Supervisory Patent Examiner, Art
Unit 1793

JR